

II. REMARKS

The first Office Action in this application, dated September 7, 2006 and the references cited therein have been carefully reviewed; this paper is intended to be fully responsive to the Office Action. Claims 1-11 presently stand rejected. Reconsideration and reexamination of this application in view of the following remarks is herein respectfully requested. After entering this response, claims 1-11 remain pending.

A. CLAIM REJECTIONS

I. 35 U.S.C. § 103

All pending claims stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,254,503, to Chiba et al. (“Chiba”), in view of U.S. Patent No. 6,106,689, to Matsuyama (“Matsuyama”).

A proper rejection under 35 U.S.C. § 103(a) requires that the Examiner establish *prima facie* obviousness. As recited in § 2142 of the MPEP, “[t]he examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness.” (emphasis in original). Three basic criteria must be met to establish a *prima facie* case of obviousness:

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

If the Examiner fails to produce a *prima facie* case, Applicants are under no obligation to submit evidence of nonobviousness. See MPEP § 2142.

Applicants respectfully submit that the Examiner has not established *prima facie* obviousness with respect to claims 1-11 for at least two reasons: (1) the rejected claims recite elements and limitations that are neither taught nor suggested by the references cited and, thus, the third criterion necessary to establish *prima facie* obviousness has not been satisfied; and (2) the Examiner has not provided a proper motivation or suggestion to combine the references cited and, thus, the first criterion necessary to establish *prima facie* obviousness has not been satisfied. These arguments will be set forth in detail below.

a. The References Cited by the Examiner, Individually and When Combined, Fail to Teach or Suggest all the Elements and Limitations of the Rejected Claims.

To properly establish *prima facie* obviousness under § 103(a), each and every limitation recited in the rejected claim must be taught or suggested by the prior art cited by the examiner. See MPEP § 2143.03. See also, In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Additionally, if a base claim is nonobvious because each and every limitation recited therein is not taught or suggested by the prior art, then any claim depending therefrom must also be deemed nonobvious. See MPEP § 2143.03. See also, In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

The Examiner states that Chiba discloses “a pulley for a CVT comprising first and second pulley halves (2/4) having truncated movable portions symmetrically opposite to each other and are movable relative to each other on a rotational axis. Each pulley half has a sloping surface (3/5) with a circumferential maximum height roughness average Ry of 0.6-2.5 micrometer and the average roughness of 0.1 to 0.5.” Office Action dated September 7, 2006, at 2, item No. 3.

Chiba, individually, and when combined with Matsuyama, fails to teach or suggest all of the elements and limitations as set forth in claims 1, 5, or 9, namely “pulley halves including truncated conical portions symmetrically opposed to each other and outer surfaces being axially opposed to each other and sloped relative to the axis, said outer surfaces having ... a circumferential roughness average (Ra,y) measured in a direction (y) circumferential to the axis”. (emphasis added). As illustrated in Figure 2, and described in paragraph [0016], Applicant’s claimed circumferential roughness average (Ra,y) is not measured in the traditional, linear fashion - measured along a straight line with a traditional contact stylus. Due to the conical geometry of the pulley surface, Applicant’s claimed circumferential roughness average (Ra,y) is measured by mapping the surface texture in a 3-dimensional path, along the pulleys circumference (preferably conducted with a non-contact optical profiler.) Therefore, the measurement (Ra,y) cannot be done with a traditional stylus roughness measurement instrument.

According to reference Figures 1 and 2, and as described in Column 4, lines 35-47, Chiba teaches that “the axially opposed outer surfaces 3 and 5 of the pulley halves 2 and 4 of the input pulley 1 has a maximum height (Ry) of 0.6 to 2.5 μm .” Chiba’s maximum height Ry is restricted in Column 4, lines 46- 47, to the “maximum height (Ry) [as] prescribed in the Japanese Industrial

Standard (JIS) B0601-1994.” The maximum height parameter R_y , as defined in accordance with JIS B0601-1994, is the maximum peak to lowest valley vertical linear distance within a single sample length of a surface irregularity measured perpendicular from a predetermined reference point. Accordingly, the centerline average roughness disclosed in Chiba is measured solely in the traditional 2-dimensional fashion, in a linear radial direction. Additionally, the Examiner acknowledges that “Chiba et al. fail[s] to disclose the average roughness $R_{a,y}$ [sic] measured in a direction (y) circumferential to the x-axis.” Accordingly, Chiba does not teach or suggest every element and limitation recited in base claims 1, 5, and 9, namely “a circumferential roughness average ($R_{a,y}$) measured in a direction (y) circumferential to the axis”.

Secondly, the Examiner states that the Matsuyama reference “discloses a surface roughness (R_a , y) to be 20nm to 600 nm, which is approximated 0.02 to 0.6 micrometer in order to avoid large and uneven irregularities.” Office Action dated September 7, 2006, at 2, item No. 3. The manufacturing method described in Matsuyama incorporates a process for the mapping of linear projections and recessed portions disposed across an uneven surface of an electroconductive substrate. According to Column 3, lines 11-34, and Column 4, 53-65, the center-line average roughness $R_a(Y)$ that is disclosed in Matsuyama is scanned along a linear path in a direction (Y), perpendicular to the linear projections. Similar to Chiba, Matsuyama also fails to teach or suggest “a circumferential roughness average ($R_{a,y}$) measured in a direction (y) circumferential to the axis.” The Examiner’s suggested combination of Chiba in view of Matsuyama does not cure the fact that neither reference teaches or suggests the claimed circumferential roughness average ($R_{a,y}$) measured in a direction circumferential to the radial axis.

In light of the above remarks, Applicants submit that the § 103(a) rejection of claims 1, 5, and 9, under Chiba in view of Matsuyama, is improper and should be withdrawn. In addition, because claims 2-4 ultimately depend from claim 1, claims 6-8 ultimately depend from claim 5, and claims 10-11 depend directly from claim 9, claims 2-4, 6-8, and 10-11 are allowable for at least the same reasons as base claims 1, 5, and 9, respectively. Accordingly, withdrawal of the § 103(a) rejection of claims 2-4, 6-8, and 10-11 based upon Chiba in view of Matsuyama is also respectfully requested.

2. The Examiner Fails to Provide a Proper Motivation or Suggestion to Modify the Pulley for a CVT of Chiba to include the Process for Forming Zinc Oxide Film for Producing a Semiconductor of Matsuyama.

The MPEP states that the teachings of multiple prior art references may be combined to produce the claimed invention and establish § 103 (a) obviousness only where there is a teaching, suggestion, or motivation to do so, found in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See § 2143.01.

To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

MPEP § 2142, citing Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). When the motivation to combine the teachings of multiple references is not “immediately apparent”, it is the Examiner’s duty to explain why said combination would actually be proper. Id. Citing Ex parte Skinner, 2 USPQ2d 1788 (Bd. Pat. App. & Inter. 1986). “The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” MPEP § 2143.01(III), (emphasis in original). See also, In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

As motivation or suggestion to combine the maximum height Ry recited in Chiba with the center-line average roughness Ra(Y) recited in Matsuyama, the Examiner states that “it would have been obvious to one of ordinary skill in the art to modify the roughness [of] Chiba et al. so that the average roughness of (Ra, y) of the maximum height (Ry) is 0.02 to 0.6 micrometer in view of Matsuyama in order to avoid large and uneven irregularities.” Office Action Dated September 7, 2006, at 2-3, item No. 3.

In conducting an obviousness analysis of the subject matter at issue, the Examiner must first determine what is “analogous prior art”. See MPEP §2141.01(a). “In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of Applicant’s endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.” Id. Citing In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). See also, State Contracting & Eng'g Corp. v. Condotte

America, Inc., 346 F.3d 1057, 1069, 68 USPQ2d 1481, 1490 (Fed. Cir. 2003) (where the general scope of a reference is outside the pertinent field of endeavor, the reference may be considered analogous art if subject matter disclosed therein is relevant to the particular problem with which the inventor is involved). Applicants respectfully submit that the Matsuyama reference is insufficient “analogous art” for the Examiner to rely upon and combine with the Chiba reference in making the § 103(a) obviousness rejection noted *infra*.

First, the Matsuyama reference is outside the pertinent field of endeavor. The Applicants’ field of endeavor is that of power transmissions for vehicles and industrial equipment, namely the design of continuously variable transmissions (“CVT”) of the pulley/sheave type. On the contrary, the Matsuyama reference is directed towards manufacturing processes of electroconductive substrates for use in semiconductor devices and photo-electricity generating devices. Clearly, the manufacture of semiconductors and photo-electric devices cannot be said to be a part of the same field of endeavor as the design of CVT transmissions for vehicles.

Second, Matsuyama is not directed at solving a problem that is reasonably pertinent to the particular problem in which Applicants’ are concerned. More specifically, Matsuyama relates to a process for “forming a zinc oxide film on an electroconductive substrate having a particular uneven surface” through deposition in liquid phase for reducing “shunt phenomenon”, increasing “open circuit voltage”, “providing a high irregular reflectance”, and “improving light absorption”. The present invention is directed towards the optimization of surface roughness friction properties of a CVT pulley to boost torque-carrying capacity, improve overall durability and wear resistance, and minimize belt slippage. There would be no motivation for one of ordinary skill in the art of CVT pulley design to combine the teachings of Chiba with the manufacturing processes for electroconductive substrates taught in Matsuyama in order to improve the surface friction properties of a CVT transmission pulley.

There is a third reason why a skilled artisan would not turn to Matsuyama to solve a pulley/sheave problem for CVT transmissions. Matsuyama’s measurements are made on steel slabs or flat plates rather than on “conical portions” such as on Applicants’ “pulley halves.” It is one thing to make a straight-line measurement in both x and y directions on a flat surface, which can be done with a contact stylus measurement method. But with Applicants’ invention, the circumferential direction is not a straight line on the pulley surface, but “conical” as Applicants’

claim. Hence, Applicants' claimed measurement cannot be done using a traditional contact stylus measurement method as proposed in Matsuyama.

In light of the above remarks, Applicants respectfully submit that examiner's § 103(a) rejection of claims 1-11 by combining the teachings of Chiba and Matsuyama is improper, and therefore should be withdrawn.


III. CONCLUSION

In view of the above remarks, this paper is believed to be fully responsive to the Office Action dated September 7, 2006. Applicants submit that no new matter has been introduced into the subject application. The remarks in support of the rejected claims are believed to place this application in condition for allowance, which action is respectfully requested.

Please charge any fees associated with this amendment to deposit account 07-0960.

Respectfully submitted,

WANG ET AL.

By: 
Christopher W. Quinn
Reg. No. 38,274

Date: 10/23/06

QUINN LAW GROUP, PLLC
39555 Orchard Hill Place, Suite 520
Novi, Michigan 48375
Phone: 248-380-9300
Fax: 248-380-8968

On behalf of:

Kathryn Marra, Esq.
GENERAL MOTORS CORPORATION
Legal Staff Mail Code 482-C23-B21
P.O. Box 300
Detroit, Michigan 48265-3000